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LIFT-TRUCK

The present invention relates to a transporter for transporting materials between a material carrier and a material destination on a freight carrier such as a truck, comprising such a transporter, and to a method for delivering goods at a busy destination difficult to access, such as a busy shopping street.

An ever increasing problem is the delivery of goods to shops which are situated in shopping streets which are busy and difficult to reach with a truck and which are not provided with sufficient parking and loading/unloading areas.

An object of the present invention is to alleviate this problem.

wa27 According to a first aspect of the present invention a transporter is provided for transporting material between a material carrier and a material destination, for instance between a truck and a shop situated at a busy location which is difficult to access, wherein the transporter comprises: a frame part and support platform which is displaceable upward and downward on the frame part between an elevated position and a lowered position, wherein the transporter is provided with releasable fixing means for releasably fixing the transporter to a loading/unloading opening of a larger material carrier, such as a truck, in which fixed situation the transporter can be transported by the carrier.

A truck provided with a transporter according to the present invention thus need no longer stand in front of the door of a shop with difficult access during loading and unloading which, in addition to the problem of reaching the shop and finding a parking space, often causes traffic jams. The truck can now park in a general

parking area, whereafter the transporter can be loaded with goods and then disconnected from the truck and the goods can be taken to the final destination on the transporter itself.

- 5 The platform of the transporter is preferably provided with one or more wheels, which wheels are mounted on the transporter so as to be foldable between a storage, non-use position and a position of use.

10 As the platform is provided with wheels, it is easy to manage and operate.

 The platform preferably has a form such that it can fit in a recess of a floor of a larger material carrier such as a truck, wherein the platform can serve as a part of the floor of the carrier when fixed thereto.

- 15 Since the platform can serve as a part of the floor of a truck, it is very easy to carry goods from the truck onto the platform.

 The support platform can take a form such that it can fit into and be removed from a pallet opening, 20 whereby loading and unloading of the goods placed on the pallet is facilitated.

 Further features of the present invention are stated in claims 5-12.

- A second aspect of the present invention 25 relates to a freight carrier comprising the above stated transporter, as according to claims 13-15.

 With such a freight carrier larger quantities of cargo can be transported to a parking space, whereafter the cargo can be displaced by means of the 30 transporter between the parking space and the shop difficult to access with a truck.

 A third aspect of the present invention relates to a method for delivering goods using the above stated freight carrier, comprising the steps of driving the 35 freight carrier to a parking area suitable for the purpose, placing the goods to be unloaded on the platform of the transporter, displacing the fork elements of the transporter downward until they come into contact with

the ground, removing the transporter from the carrier opening, displacing the transporter platform downward and folding out the wheels thereof to their position of use, whereafter the transporter and the goods can be displaced
5 to the desired location.

A further aspect of the present invention relates to a method of transporting involving a material carrier such as a truck, a transporter as described and a third means of transport, such as a hand pallet truck,
10 wherein cargo is driven out of a loading space of the carrier onto the platform of the transporter, whereafter the transporter with the cargo and the third means of transport are displaced, whereafter the cargo is driven off the platform with the third means of transport, and
15 vice versa.

The third means of transport and/or the transporter can further be provided with securing means.

If provided with securing means, the third means of transport can be used to enclose the cargo at
20 the rear side of the platform, so that during use of the transporter the cargo cannot fall off at the rear.

wp 637 The present invention will now be described on the basis of the description hereinbelow which makes reference to the figures, in which:

25 figure 1 shows a perspective view of a preferred embodiment of the transporter according to the present invention;

figure 2 is a perspective view of a freight carrier plus transporter according to the present
30 invention;

figure 3 shows a further partly cut-away perspective view of the transporter of figure 1;

figures 4 and 5 show partly cut-away perspective views of the transporter and truck according
35 to the present invention during unloading of a pallet;

figure 6 is a perspective view of the transporter fixed to a truck;

figure 7 is a perspective view of a freight carrier plus another embodiment of the transporter according to the present invention;

figures 8 and 9 show further partly cut-away perspective views of the transporter, wherein this latter is enclosed in a truck;

figure 10 is a perspective view of a further embodiment of the transporter according to the present invention; and

10 figures 11 and 12 show partly cut-away perspective views of the releasable locking mechanism for releasably locking the transporter to for instance a truck.

WO 947 A transporter according to figure 1 comprises a 15 frame part 2, a housing 4 in which a motor (not shown) is housed, an upright displaceable carrier 6, a support platform 8 which is mounted on the carrier, two forks 10 extending from housing 4, which forks 10 are provided with rollers 12 at the front end thereof, two rear wheels 20 14 and a steering column 16.

Platform 8 is provided on a front end with a pivotable flap 18. Platform 8 is also provided with two fold-away wheels 20 which are mounted in wheel suspensions 22 which are in turn arranged pivotally in 25 two length profiles 24 under platform 8.

A hydraulic piston rod mechanism 26 extends from beneath platform 8 and is arranged on a front end thereof below flap 18.

Carrier 6 is displaceable up and downward in 30 frame part 2 whereby platform 8 is also displaceable up and downward.

In its lowered position the platform 8 makes contact with the surface of forks 10 (see figure 3). In this position the platform wheels 20 are folded away. If 35 the piston rod is retracted, as in figure 3, the front end of flap 18 can touch the ground, in order to provide an easy transition between the ground and platform 8.

In its extended position the piston rod 26 ensures that flap 18 is in line with the platform (see figure 1).

In a position which is not shown, platform wheels 20 can come into contact with the ground in their folded-down position when the platform is in its lowered position, wherein wheels 20 serve as front wheels of transporter 1. In this situation the rollers 12 of forks 10 are no longer in contact with the ground.

Platform 8 and front flap 18 have a profile which fits into a recess 26 of floor 28 of the container space 30 of a truck 32 (see figures 2 and 4).

Transporter 1 can be fixed to the rear side of truck 32 by means of fixing means (not shown). In this fixed position the platform 8 and forks 10 engage the rear side 34 of truck 32. In this fixed state (figure 6) the transporter 1 is displaceable by means of the truck.

The container opening of the truck can be closed in this situation (see figure 6).

During use the truck and transporter can be driven to a parking area.

The rear side of the truck can then be opened, whereafter forks 10, rear wheels 14, housing 4, steering column 16 and frame part 2 of transporter 1 are lowered so that rear wheels 14 and front rollers 12 of forks 10 come into contact with the ground (see figure 4). A pallet truck 38 situated in the container space 30 of truck 32 can then be driven onto the platform 8 of the transporter.

Transporter 1 can then be manoeuvred away from truck 32 (see figure 5), whereafter wheels 20 of platform 8 can be folded down, platform 8 can be lowered and the transporter plus pallet truck 38 can be taken to their destination.

The embodiment shown in figure 7 has two upper forks 50, which are separated. A pallet can thus be directly loaded herewith. The pivotable wheels are here mounted on forks 50, wherein a platform is pushed over

the fork parts (and hooked on or otherwise fixed) as if it were a pallet.

It is then possible to utilize the platform and the transporter separately.

- 5 The platform can be used to cover the recess in the loading floor of the truck at floor level, even if the transporter is not being transported or if the transporter delivers a pallet directly on the forks.

- 10 The transporter with upper forks can be detached from the truck while the platform remains in the recess of the cargo container.

It is possible for the lower forks to be wider than the platform or the upper forks (and therefore not to be situated precisely under the platform).

- 15 It is possible for the lower forks to be roughly as wide as the external width of the truck.

It is possible for the platform to have about the same width as the internal width of the truck.

- 20 It is possible for one or more of the pivotable wheels to be directed transversely of the forks. During disconnection from the truck the transporter can then travel backward on the rollers and sideward on the pivotable wheels mounted on the platform.

- 25 The pivotable wheels can be folded away or folded down while the platform is loaded. The object of the fold-down wheels is to save space in combination with providing the option of being able to carry the cargo on the platform closer to the ground in respect of driving on and off for instance a hand pallet truck.

- 30 It is further possible for the whole transporter (including frame part) to be fixed in a recess in the contour of the cargo container, so that the transporter does not protrude at all outside the contour of the cargo container. When the loading space is closed
- 35 the transporter lies wholly within the closed loading space in this embodiment and is protected against rain, theft and damage.

It is possible for the platform to be provided with (removable) (side) walls.

It is possible for the ramp (18) to be lockable in vertical position. This is to limit the dimension during use as transporter and/or to enclose the cargo.

The recess in the loading floor of the truck can be closed on the underside.

It is important that the top side of the platform or upper forks preferably has a substantially flush connection to the surface of the cargo container of the material carrier.

The whole transporter can fit into a recess of the (closed) loading space, even at the side of the loading space of the truck (see figures 8 and 9).

In a second preferred embodiment of transporter 100 as shown in figures 10-12, the lower forks 110 are displaceable up and downward in frame part 112 by means of a piston rod mechanism 114, which piston rod 114 is mounted on the lower side thereof on a bottom cross beam 115 of frame 112 and on the upper side thereof on a lying transverse upper part 116 of lower forks 110.

Upper forks 124, which are also provided with front wheels (not shown), extend from a cross beam 118 which is displaceable up and downward.

Cross beam 118 is provided on the end thereof with two upright sleeves 122 which are displaceable up and downward over two side arms 126 of frame 112.

A transverse frame beam 128 extends between the upper ends of side arms 126.

A piston rod assembly 130 is fixed at an upper end thereof to frame beam 128 and at a bottom end thereof to the cross beam 118 of upper forks 124. Upper forks 124 are in this way displaceable up and downward over frame 112.

Two recesses 132 corresponding with upper forks 124 can be found in the floor 136 of the truck.

The innermost end of upper forks 124 is provided with holes or slots 140 (see also figure 11).

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The locking mechanism 142 is mounted between the recesses 132 in floor 136 of the truck.

Locking mechanism 142 has two opposite arms 144 which are provided with nose portions 146.

5 A spring 148 extends between the two arms 144.

Arms 144 are mounted pivotally on a rectangular body 150 which is provided on the front thereof with a rod 152, which rod 152 is mounted displaceably in a fixed block 154. This block 154 is fixed to the floor of the
10 truck.

Each arm 144 is provided on the upper end thereof with two cables 156, which two cables 156 are guided through a triangular part 158 so as to come together as one cable 160 at the top of triangle 158. If
15 cable 160 is pulled taut, the two cable 156 are also pulled taut and nose portions 146 of arms 144 are pulled inward, whereby these noses 146 are no longer found in the holes 140 of upper forks 124, whereafter the upper forks 124 can be detached.

20 When cables 156 are tensioned, the body 150 of coupling mechanism 142 is pushed downward by means of arms 144, whereby the rod 152 extends in a corresponding recess 162 of the truck floor.

When transporter 100 is mounted on the truck,
25 the upper forks 124 push noses 146 of arms 144 inward until the noses drop into the holes 140 of upper forks 124, whereby the transporter is locked in the truck floor.

After locking of the transporter in the truck
30 floor, the body 150 of locking mechanism 142 can be placed further forward relative to the truck floor recess, whereby the transporter is pulled further into the floor in order to effect a good positioning.

Transporter 100 can be locked to and released
35 from the truck as follows:

The transporter can approach the container of the truck, so that upper forks 124 come roughly into line with recesses 132 of the floor of the truck.

Although it is desirable that upper forks 124 can approach the recesses 132 in one line, it will be apparent that, if this is not the case, the transporter can approach the truck "out of line" and that the attachment will then align itself.

The own weight of the transporter assists in finding the correct point of engagement in the floor recesses 132.

When the rod 117 of piston rod combination 114 is displaced upward, the lower forks 110 are pressed out relative to housing 4 in the direction of the ground, whereby transporter 100 inclines backward as a whole.

When lower forks 110 are raised relative to housing 4 as shown in figure 10, the transporter will incline forward as a whole.

Making use of this technical possibility, the point of support of the transporter can be displaced, during coupling and loading onto the truck, from the support at the front end of lower forks 110 to a point of support at the front ends of upper forks 124. The point of support at the front end of lower forks 110 is thus transferred during loading to the point of support at the front end of upper forks 124. It is thus impossible for the transporter to become suspended from the truck when they are locked to each other.

The transporter is then displaced forward until the upper forks are locked in the floor of the truck in the manner described above.

Complete locking is achieved after the housing and the lower forks are raised, as according to figure 6, whereafter the transporter is ready for displacement by means of the truck.

Release of the transporter is possible in reverse sequence. The transporter can only be released if the body 150 of coupling mechanism 142 is moved back (as shown in figure 12), and cables 156 and 160 are tightened.

The present invention is not limited to the above described preferred embodiment thereof; the rights sought are defined by the following claims, within the scope of which many modifications can be envisaged.